

7. (New) The coating method according to claim 1, wherein the rinsing liquid is a solvent of the coating liquid.

8. (New) A method of rinsing a coating head having a slit for ejecting a coating liquid comprising the steps of:

stopping a supply of a coating liquid to said coating head after ejecting the coating liquid; and

supplying a rinsing liquid from a rinsing liquid supply path extending to said coating head.

Remarks

The claims are 1, 2, 4 and 6-8, with claims 1 and 8 being independent.

Claims 1, 2 and 4 have been amended. New claims 6-8 have been added. Support for the amendments and new claims can be found throughout the specification at, inter alia, page 6, lines 20-26, page 10, lines 14-19, and Embodiments 1-5. Reconsideration of the present claims is respectfully requested.

Claims 1, 2 and 4 stand rejected under 35 U.S.C. §112, second paragraph.

In particular, the Examiner alleges that the phrase “making a rinsing liquid flow to said coating head from a coating liquid supply path extending to said coating head” renders the claims vague and indefinite. Accordingly, Applicants have amended claim 1 to address the Examiner’s concern and therefore respectfully request withdrawal of this rejection.

Claims 1 and 2 stand rejected under 35 U.S.C. §102(a) as being anticipated by Asahi (JP 10-282329). Claims 1 and 2 stand rejected under 35 U.S.C. §102(b) as being anticipated by each of Maneke (U.S. Patent No. 4, 704,308), Henninger (U.S. Patent No. 4,560,584) and Poag (U.S. Patent No. 5,958,517). Claim 4 stands rejected under 35 U.S.C. §103(a) as being obvious over Applicants’ admitted prior art in view of each of Asahi and Poag. Applicants respectfully traverse these rejections.

Prior to addressing the merits of the prior art rejections, Applicants believe that a review of the background, key features and advantages of the present invention would be helpful. In general, when a coating head having a slit is used for ejecting a coating liquid onto a member to be coated to form a coating film thereon, a solidified component of the coating liquid often clogs the ink ejection path at the tip of the coating head. When such clogging occurs, a defect in the coated film also occurs. This clogging is particularly prevalent when an ink ejection orifice is formed in a slit shape even when only a small amount of solidified component is present. In fact, a slit-shaped orifice is more likely to be clogged than a shape such as circular, even if the area of the slit shape orifice and the circular orifice are the same. Further, it should be noted that when using a coating head with a slit orifice, a crosswise width of the ejecting orifice at the tip of the slit can be made larger (e.g., 356 nm, see page 19, lines 23-24), thereby facilitating drying of the coating liquid; therefore, the solidified component would stop up the slit and form a strip-shape coating defect.

Thus, it is clear that due to this above-described clogging problem, it is necessary to rinse the inside of the slit orifice both during the coating process and when supply of a coating liquid is stopped. However, such a rinsing process leads to a greater use of both rinsing liquid and coating liquid. The net effect is a large waste of resources. In addition, because an operation to return the head from rinsing back to coating would be necessary, availability of the coating head and thus productivity becomes a factor. The present invention is pointedly directed to solve these problems. In short, the present invention is directed to a method of ejecting a coating liquid over the surface of a member to be coated to form a coated layer thereon. Importantly, ejection is performed via a slit formed at the coating head. The method of the present invention necessarily includes a step during which the inside of the slit is rinsed by stopping the flow of coating liquid and a step during which rinsing liquid is supplied to the coating head via a rinsing liquid supply path. According to the present method, solidification of the coating liquid at the slit is

prevented, coating defects are therefore prevented and both coating liquid and rinsing liquid are conserved.

Asahi discloses a method of manufacturing a color filter including a step of rinsing an inside of an ink jet head during a process of forming pixel sections of the color filter. However, Asahi necessarily uses an ink jet recording medium for ink ejection. An ink ejection orifice would be a small circular shape or the like, but not a slit. Accordingly, Asahi fails to provide any guidance with regard to alleviating the technical problem associated with rinsing a coating head having a slit-shaped ejection orifice. What is more, as shown in Figure 1 therein, Asahi does not disclose the direct supply of rinsing liquid into the ink jet head. It is clear that Asahi fails to anticipate the present invention.

Maneke discloses a coating apparatus for ejecting adhesive coating liquid from a nozzle orifice wherein, when a coating operation ceases for a prolonged period of time, the nozzle orifice is rinsed (column 1, line 10). The ejection orifice of Maneke, like that of Asahi, is also circular in shape. Maneke therefore fails to provide any guidance with regard to alleviating the technical problem associated with rinsing a coating head having a slit-shaped ejection orifice. Accordingly, Maneke fails to anticipate the present invention.

Both Henninger and Poag relate to spin coating methods using circular ejection orifices. Neither of these references provides any guidance with respect to the technical problems detailed above. Accordingly, neither Henninger or Poag anticipates the present invention.

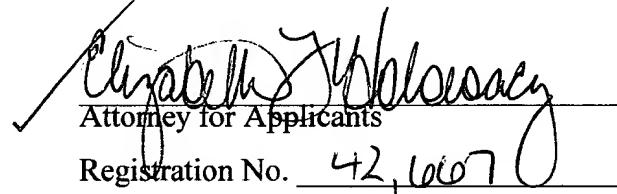
Finally, no combination of the cited references renders the present invention obvious. There is simply no disclosure or suggestion of the key features of the presently claimed invention, namely a slit ejection orifice and the direct supply of rinsing liquid to the coating head. Accordingly, Applicants respectfully request withdrawal of the prior art rejections.

This Amendment After Final Rejection is believed clearly to place this application in condition for allowance. Its entry is therefore believed proper under 37

C.F.R. §1.116. Accordingly, entry of this Amendment After Final Rejection, as an earnest attempt to advance prosecution, is respectfully requested. Should the Examiner believe that issues remain outstanding, the Examiner is respectfully requested to contact Applicants' undersigned attorney in an effort to resolve such issues and advance the case to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address given below.

Respectfully submitted,


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VERSION SHOWING CHANGES MADE TO CLAIMS

1. (Twice Amended) A coating method of ejecting a coating liquid over the surface of a member to be coated from a slit formed at a coating head and thus forming a coated layer thereon [by relatively moving a coating head and said member to be coated,] comprising the steps of:

[a step of] rinsing [said coating head] an inside of said slit by stopping a supply of the coating liquid to said coating head after ejecting the coating liquid, and

[making] supplying a rinsing liquid [flow to said coating head] from a [coating] rinsing liquid supply path extending to said coating head.

2. (Amended) [A] The coating method according to claim 1, further comprising a step of supplying the rinsing liquid trace by trace or intermittently to said coating head.

4.-(Amended)-A-method-of-manufacturing-a-color-filter-substrate[,]
comprising the steps of:

[a step of] coating a photosensitive resinous composition over a substrate by said coating method according to claim 1;

[a step of] obtaining a black matrix pattern by forming a pattern on said photosensitive resinous composition; and

[a step of] applying a coloring ink so as to fill in a black matrix pattern gap.

6. (New) The coating method according to claim 1, wherein when the supply of the coating liquid is stopped, the rinsing liquid is supplied to said coating head periodically.

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7. (New) The coating method according to claim 1, wherein the rinsing liquid is a solvent of the coating liquid.

8. (New) A method of rinsing a coating head having a slit for ejecting a coating liquid comprising the steps of:

stopping a supply of a coating liquid to said coating head after ejecting the coating liquid; and

supplying a rinsing liquid from a rinsing liquid supply path extending to said coating head.